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G4H

H3Q

Selected US specifications from IPC sub-class H03J

(54) Infrared remote control system

(57) The infrared remote control system comprises devices MA-MD having respective first infrared remote controllers (not shown) for controlling the respective devices and a second infrared remote controller 10 which is different from the first remote controllers. The second controller 10 has an input device 1, an infrared detector 2, a controller 3, a memory 4, and an infrared emitter 5. The infrared detector 2 is able to detect the single or multiple signal patterns delivered from the first infrared controllers, for thereby storing the signal patterns in the memory 4. The controller 3 chooses a prescribed signal pattern from among the signal patterns stored in the memory 4 upon actuation of the input device 1, and delivers the prescribed signal pattern from the infrared emitter 5. An automatic administration device, for timed control, may be included in the second controller 10.

FIG. 1 (a)

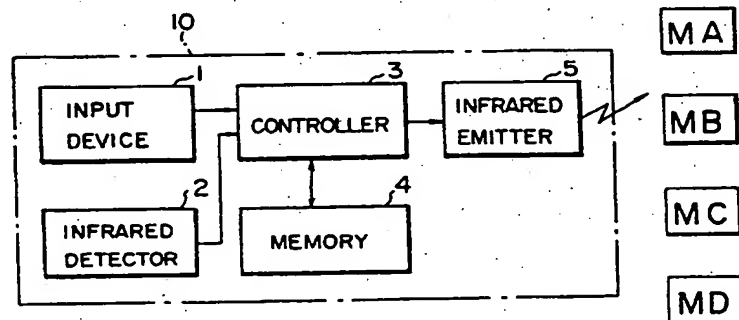


FIG. 1 (b)

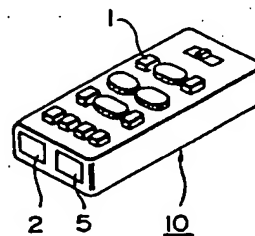
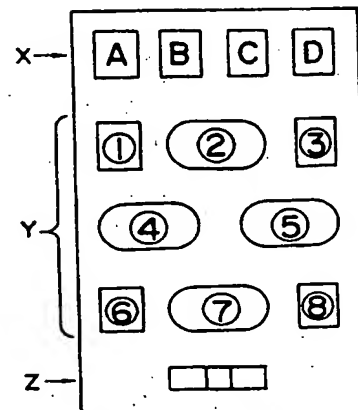


FIG. 1 (c)



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FIG. 1 (a)

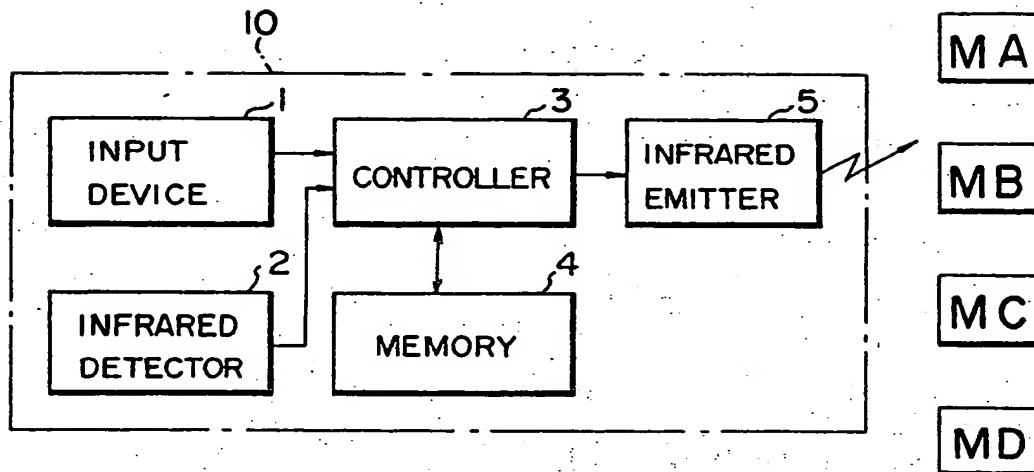


FIG. 1 (b)

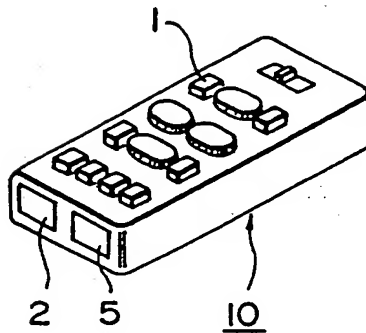


FIG. 1 (c)

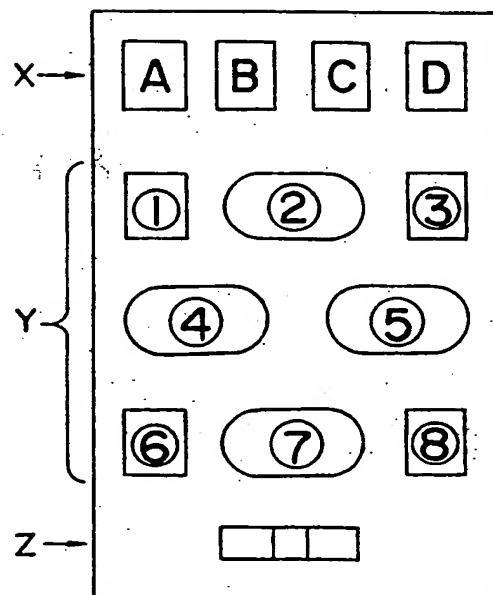


FIG. 2

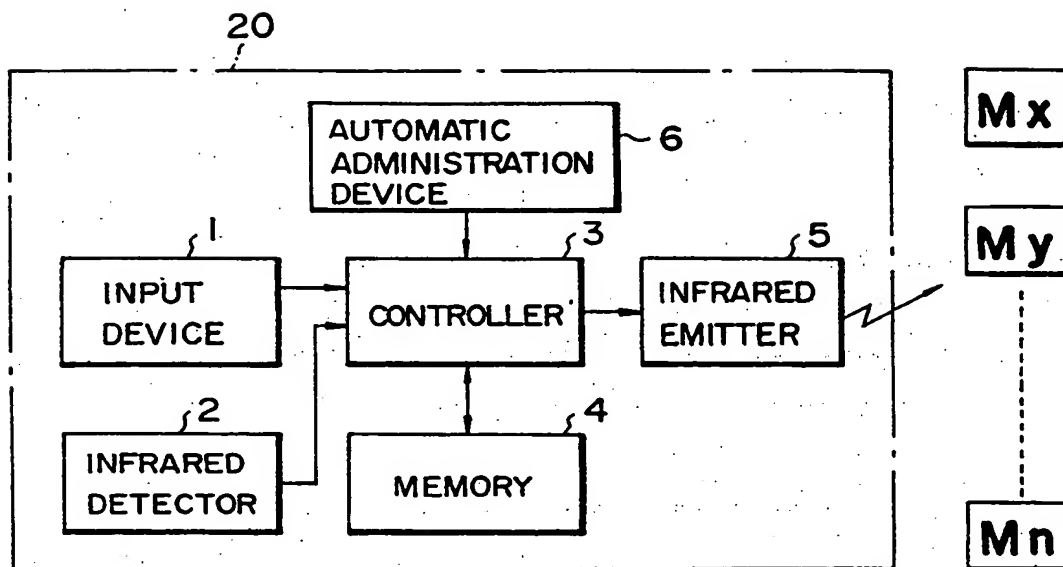
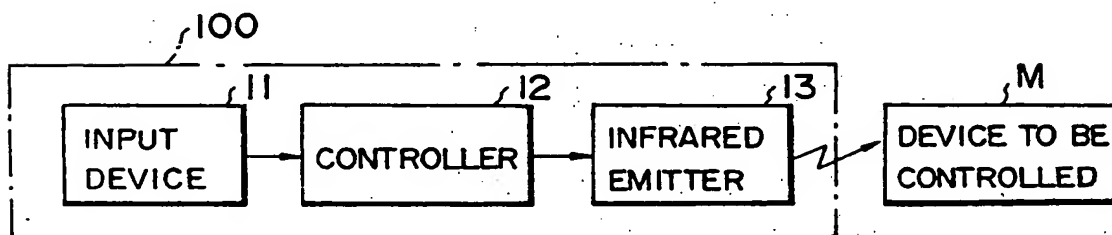


FIG. 3



## SPECIFICATION

**Infrared remote controller for plurality of devices**

5 The present invention relates to an infrared remote controller for a plurality of devices, each having a remote controller, capable of uniformly controlling each of the devices with use of a single remote controller without resorting to each of the remote controllers of the devices which has different operation system and signal pattern when controlling with use of an infrared wave such devices as TV set, video deck, CD player or a video disk, etc. used in a family.

Recently, there are many such controllers as those utilizing an infrared wave for TV set, video deck, CD player or video disk, etc.

20 A conventional remote controller comprises, as shown in a block diagram of Fig. 3, a remote controller 100 composed of an input device 11 such as a button, a controller 12, an infrared emitter 13, and a device to be controlled such as TV set etc. housing an infrared detector therein and actuatable in response to a received signal. When a prescribed input is applied to the controller 100 by an operation of the input device 11, the controller 12 is set to deliver a pulse signal in response to the prescribed input from the infrared emitter. Such remote controller is operated in the manner that a channel is changed in turn to another channel by pressing a button, and directly to another channel corresponding to the numeral indicating a channel by pressing the button showing the numeral in case of TV set. Even if the manner of operation of the devices is same, a wrong operation is avoided by actuating only by a signal pattern peculiar to each type of device.

There is a tendency recently that a plurality of devices are arranged in a same room of a family. In such cases, a plurality of remote controllers 100 are located in the same room which is resultant to be complicated and troublesome in operation of each device to be controlled and troublesome in automatic administration.

50 The present invention has been made to solve the problems when there are provided a plurality of devices to be controlled each having an infrared remote controller operated in different manner or in a signal pattern.

55 What is desired is an infrared remote controller capable of uniformly controlling remotely and administrating automatically a plurality of various types of devices to be controlled with use of a single remote controller without modifying the plurality of the devices to be controlled. An infrared remote controller capable of controlling a plurality of devices to be controlled each having an infrared remote controller which is operable respectively in different way and has different signal pattern

70 comprises a remote controller which is different from the infrared remote controller attached to the devices to be controlled. The remote controller is composed of an input device, an infrared detector, a controller, a memory and an infrared emitter. The infrared detector is capable of detecting a single or a plurality of signal pattern peculiar to outputs delivered from the attached remote controller for each of the devices to be controlled for thereby allowing the memory to store the signal pattern via the controller. A prescribed signal pattern is selected from signal patterns stored in the memory by the operation of input device to deliver from the infrared emitter so that the devices to be controlled is remotely controllable.

It is also an object of the present invention to provide an infrared remote controller capable of controlling remotely each of the devices to be controlled which is interchangeable with those attached to the devices to be controlled.

90 *In the accompanying drawings:*

Fig. 1 (a) is a block diagram showing an entire structure of an infrared remote controller according to an embodiment of the present invention;

95 Fig. 1 (b) is a perspective view showing an infrared remote controller;

Fig. 1(c) is a plan view of an input device of an infrared remote controller;

100 Fig. 2 is a block diagram showing an entire structure of an infrared remote controller according to another embodiment of the present invention; and

Fig. 3 is a block diagram showing a structure of a conventional infrared remote controller.

105 An infrared remote controller according to a first embodiment of the present invention will be described with reference to Figs. 1 (a) to (c).

110 Fig. 1 (a) is a block diagram showing an entire structure of the infrared remote controller. Designated at 10 is a remote controller, and MA, MB, MC, MD are respectively devices to be controlled. The remote controller 10 comprises an input device 1, an infrared detector 2, a controller 3, a memory 4, and an infrared emitter 5 housed in a prescribed shaped case with a power source such as a dry battery etc., and placeable at an operator. The input device 1 is disposed at a side end of a case as shown in Fig. 1 (c), and comprises a group X composed of buttons appearing as A, B, C, and D to be controlled, a group Y of function selection buttons shown as 1, 2, ... 8 corresponding to a single or a plurality of fixed pattern signals (including a device actuation starting signal) peculiar to the devices M to be controlled, and an input/output mode changeover switch Z. The infrared detector 2 is disposed adjacent to the infrared

emitter 5 located at an end of the case 1.

It is not necessary to modify or add some accessories to the devices MA to MD to be controlled which are kept as manufactured.

- 5 The remote controller 10 thus structured is operated in the following manner to register the information.

When the registration operation of the fixed pattern signal of the device MA to be controlled is effected, the input/output mode changeover switch Z is shifted to an input side, and the button A, for example, among the selection button group of the devices to be controlled is pressed down to be ready for inputting the fixed pattern signal of the device MA to be controlled of the control device 3, for thereby permitting the infrared emitter 13 of the attached remote controller 100 of the device MA to be controlled to oppose the infrared detector 2 of the remote controller 10. The fixed pattern signal as a first function peculiar to the control device 12 of the attached remote controller 100 is set to the button 1 among the function selection button group Y, for example, if the signal is a device operation starting signal for thereby allowing the control device 3 to be ready for inputting the device operation starting signal by pressing the function selection button 1 so that the infrared emitter 13 delivers the device actuation starting fixed pattern signal by actuation of the input device 11 of the attached remote controller 100. The output fixed pattern signal is detected by the infrared detector 2 of the remote controller 10 and stored in the memory 4 via the controller 3 as the device operation starting fixed pattern signal of the device MA to be controlled.

Successively, the button 2 among the function selection button group Y when the controller 12 has a plurality of fixed pattern signals is pressed down to store the fixed pattern signal predetermined as a second function of the device MA to be controlled in the same manner as set forth above. The button 3 among the function selection button group Y is pressed down to store the fixed pattern signal predetermined as a third function of the device MA to be controlled. In such procedures of operation, the fixed pattern signal predetermined in each of the devices to be controlled is stored in the memory 4 by selectively operating each button 1 to 8 within a range of eight functions among the function selection button group Y and the registration operation is completed. Successively in the same manner, upon storing all the fixed pattern signals in the memory 4, predetermined for all functions of the devices MC, MD to be controlled, the input/output mode changeover switch Z is shifted to the output mode to complete all the registration operation.

During the operation of the remote controller 10, when the device MB to be controlled is actuated, the button B among the selection

button group X for the devices to be controlled is pressed down, and the infrared emitter 5 of the remote controller 10 is directed to the device MB to be controlled and the prescribed button 1 among the function selection button group Y is pressed down so that the controller selects the fixed pattern signal corresponding to the button 1 of the device MB to be controlled among the fixed pattern signals respectively responsive to the devices MA to MD to be controlled and stored in the memory 4 to deliver the fixed pattern signal from the infrared emitter 5. The output signal from the infrared emitter 5 is detected by a detector housed in the device MB to be controlled and the device MB to be controlled is actuatable in response to the detected fixed pattern signal. When the button 5 among the function selection button group Y is pressed down during the operation by the fixed pattern signal corresponding to the button 1 of the device MB to be controlled, the controller 3 selects the fixed pattern signal responsive to the button 5 among the device MB to be controlled among the the fixed pattern signal respectively of the devices MA to MD to be controlled and stored in the memory 4 and allows the infrared emitter 5 to deliver the fixed pattern signal so that the output signal is detected by the detector housed in the device MB to be controlled whereby the device MB to be controlled is switched to an operation responsive to the detected fixed pattern signal.

The device MD to be controlled is of course operated in response to the prescribed button in parallel with the operation of the device MB to be controlled when the button D among the selection button group X for the devices to be controlled of the remote controller 10 during the operation of the device MB to be controlled is pressed down and the infrared emitter 5 is directed to the device MD to be controlled, and further the prescribed button among the function selection button group Y is pressed down.

According to the embodiment, although it is possible to register the eight functions of each of the devices MA to MD to be controlled with use of the eight buttons of the input device and four sets of the devices MA to MD as M to be controlled. It is of course possible to control more devices M to be controlled when the storage capacity of the memory is set to a prescribed value with use of more than five selection buttons of the devices to be controlled and more than nine function selection buttons.

A structure of a second embodiment of the present invention includes the elements as covered in the first embodiment, and an automatic administration device. The input device is set to operate in a prescribed manner based on an information previously inputted in the input device according to a command is-

sued by the automatic administration device for thereby allowing the device to be controlled to actuate in a prescribed manner.

The infrared remote controller according to the second embodiment is structured that a plurality of the fixed pattern signal peculiar to the plurality of the devices each having the infrared remote controller which has a different system of operation and an operation signal pattern is entirely stored in a memory of a single remote controller and the self-administration is effected by the remote controller without modifying a plurality of devices to be controlled. A desired fixed pattern signal corresponding to a desired device is selected from the memory in accordance with a predetermined set time, sequence etc. to effect a remote control so that an interchangeable operation and an automatic administration operation are effected to permit the devices to effect a prescribed operation.

An infrared remote controller according to a second embodiment of the present invention will be described with reference to Fig. 2. The infrared remote controller 20 has an automatic administration device 6 in addition to the elements of the remote controller in the first embodiment.

The automatic administration device 6 may employ, for example, a timer, or a simple sequence program setting unit. In case that the automatic administration device 6 employs the timer, a button corresponding to Mx to be controlled which is chosen from a group of devices Mn to be controlled, and a button corresponding to a function y chosen from a function selection button group are pressed down with use of the input device 1 of the remote controller 20 to set to a issue a desired command, and thereafter a desired time is set to the automatic administration device 6 composed of the timer. After lapse of time set to the automatic administration devices, the input command is actuated to operate the remote controller 20 so that the device Mx to be controlled is actuated to be turned on or off upon detecting the output signal from the remote controller 20.

When the automatic administration device 6 employs a sequence program unit, an operation sequence of the plurality of devices M such as Mx, My to be controlled previously chosen from the group Mn of the devices to be controlled and each function of the devices M are inputted with use of the sequence program 6 and the input device 1 so that the remote controller 20 is actuated to allow a device My in next turn to start the prescribed operation in response to the input command upon completion of prescribed operation of device Mx based on the input command.

According the present invention, even if there exist a plurality of remote controllers for a plurality of devices which are differently controlled and have a different operation patterns,

it makes possible to control uniformly the plurality of devices with a single remote controller which is resultant to avoid the complicated operation and an automatic administration thereof without use of respective remote controllers for the plurality of devices. Further, modification of the devices to be controlled is not required and the wrong operation is avoided since the same signal as the output signal of the conventional attached remote controller is inputted. Still further, various devices to be controlled are automatically administered.

## 80 CLAIMS

1. An infrared remote control system for a plurality of devices, comprising:
  - a plurality of devices having respective first infrared remote controllers for controlling the respective devices,
  - a second infrared remote controller which is different from the first infrared remote controllers,
  - the second infrared remote controller comprising input means, an infrared detector, control means, a memory, and an infrared emitter, the infrared detector being adapted to detect a single signal pattern or a plurality of signal patterns delivered from a first infrared controller for thereby storing the said delivered signal pattern(s) in the memory,
  - the control means being adapted to choose a prescribed signal pattern among the signal patterns stored in the memory upon actuation of the input means and to deliver the prescribed signal pattern from the infrared emitter.
2. A system as claimed in claim 1, in which the second infrared remote controller is housed in a case with a power source.
3. A system as claimed in claim 1 or 2, in which the infrared detector is disposed adjacent to the infrared emitter.
4. A system as claimed in any preceding claim, in which the input means comprises a selection button group for selecting each of the devices to be controlled a function selection button group corresponding to a single fixed pattern signal or a plurality of fixed pattern signals peculiar to each of the devices to be controlled, and a changeover switch for changing to input or output.
5. An infrared remote control system for a plurality of devices, comprising:
  - a plurality of devices having respective first infrared remote controllers for controlling the respective devices,
  - a second infrared remote controller which is different from the first infrared remote controllers,
  - the second infrared remote controller comprising input means, an infrared detector, control means, a memory, automatic administration means, and an infrared emitter,
  - the input means being set to operate in ac-

cordance with prescribed information based on a command issued by the automatic administration means for thereby allowing the plurality of devices to be controlled to act in a pre-

5 scribed manner.

6. infrared remote control system substantially as described with reference to, and as shown in, figures 1 (a) to (c) or figure 2 of the accompanying drawings.

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